National Biosolids Partnership
Biosolids EMS Audit Report

City of Chattanooga Moccasin Bend Wastewater Treatment Plant
Chattanooga, TN

Verification Audit

Audit Dates: October 20 – 23, 2008 & January 29 & 30, 2009

Audit Conducted By:

KEMA-Registered Quality, Inc. (Chalfont, PA)

Auditors: Mr. Jon Shaver, Biosolids EMS Lead Auditor
Mr. Dale Scherger, Biosolids Auditor

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Report Date: February1 2, 2009

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1. EXECUTIVE SUMMARY

KEMA-Registered Quality Inc. (KEMA) conducted an independent Verification Audit of the management system being used by the City of Chattanooga Moccasin Bend Wastewater Treatment Plant in managing its biosolids program. The audit was performed October 20 to 23, 2008 and January 29 to 30, 2009 at the request of the National Biosolids Partnership (NBP) as part of the City of Chattanooga's participation in the NBP EMS Program.

The purposes of this audit were to:

- Verify that the management system being used by City of Chattanooga in managing its biosolids activities meets the expectations and requirements of the National Biosolids Partnership's EMS Program, particularly the 17 EMS Elements (audit criteria).
- Confirm that the City of Chattanooga biosolids management program is functioning effectively and as intended, with practices and procedures being performed as documented.
- Examine outcomes that City of Chattanooga is achieving through the use of a systematic approach to managing their biosolids program.

The scope of this audit included the full City of Chattanooga biosolids program, as defined in their Biosolids Management System (BMS) Manual, and covered all activities within the City of Chattanooga Moccasin Bend Wastewater Treatment Plant biosolids value chain.

During the audit KEMA reviewed processes and activities used by City of Chattanooga in managing its biosolids program and assessed the conformance of these processes with expectations and requirements of the National Biosolids Partnership EMS Elements. .In addition, KEMA identified strengths in the City of Chattanooga biosolids management system (BMS) and examined outcomes being achieved by using a management system approach in the areas of regulatory compliance, environmental performance, relations with interested parties and biosolids quality practices. These strengths and outcomes are detailed in the body of this report.

During the initial audit in October 2008 KEMA found major nonconformances and minor nonconformances in the City of Chattanooga's biosolids management system. In response, the City of Chattanooga took corrective action to address the nonconformances and during a follow-up audit on January 29 and 30, 2009 KEMA verified that the major nonconformances and some of the minor nonconformances have been effectively corrected.

Based on the results of these two audits, KEMA has verified that the City of Chattanooga biosolids management system meets the expectations and requirements of the National Biosolids Partnership EMS Program and is performing effectively. We recommend that the City of Chattanooga Moccasin Bend Wastewater Treatment Plant be certified within the NBP EMS Program.

2. AUDIT DETAILS

2A. Local Agency Details

Agency Name, Location: City of Chattanooga Water Resource Division, Chattanooga, TN (referred to as "City of Chattanooga" in this report)

Biosolids Production Location(s): Moccasin Bend Wastewater Treatment Plant, Chattanooga TN

Number of Employees (approximate): 110

Volume of Wastewater Treated (approximate): = average 65 MGD (combined sewers) with capacity to 140 MGD and wet weather treatment of additional 90MGD

Tons of Biosolids Produced (approximate): 93,000 wet tons per year (Class B)

Biosolids Use / Disposition Sites Audited

Howell Moss Farms, Marion County TN (2 sites)

Contractors Participating in Audit

Recyc LLC (biosolids transportation and land application)

2B. Audit Team

The National Biosolids Partnership assigned KEMA-Registered Quality Inc. to perform this audit on their behalf. The KEMA Audit Team included Mr. Jon Shaver (Biosolids EMS Lead Auditor) and Mr. Dale Scherger (Biosolids Auditor), both of whom are qualified for their roles through certification by the National Biosolids Partnership. KEMA asserts that our firm and auditors have an independent relationship with the City of Chattanooga that meets criteria established by the National Biosolids Partnership for Third Party Audit Companies and Auditors.

2C. Audit Scope and Methodology

The scope of this audit included all parts of the City of Chattanooga Moccasin Bend Wastewater Treatment Plant biosolids program, which encompasses pretreatment, wastewater treatment and solids generation, biosolids stabilization, storage and transportation and end use / disposition, with special attention to practices and management activities that directly support biosolids-related operations, processes and activities.

The audit included the following topics, consistent with NBP requirements and the Scope of Work agreed by NBP and KEMA dated August 8, 2008.

1. Review of documentation describing the biosolids management system and its use.
2. Examination of outcomes being achieved in the areas of regulatory compliance, interested party relations, environmental performance and quality practices.
3. Process Audits (covering requirements of applicable EMS Elements and review of process effectiveness):
   - Biosolids Storage & Transportation

- Biosolids Use & Disposition - Agriculture
- Communication Program
- Competency, Awareness & Training
- Compliance (with legal & other requirements)
- Contractor Control
- Critical Control Points & Operational Controls (Identification)
- Document Control & Recordkeeping
- Emergency Preparedness
- EMS Planning & Public Participation
- Engineering (incl process design)
- EMS Documentation
- Goals & Objectives
- Internal Audits
- Maintenance
- Management Involvement (incl Policy, Mgmt Review)
- Pretreatment & Collection
- Preventive and Corrective Action
- Solids Stabilization, Conditioning & Handling
- Wastewater Treatment & Solids Generation

The audit was conducted by qualified auditors guidelines stated in the NBP Auditor Guidance (August 2007) and KEMA's Biosolids EMS Audit Planning Guide.

Using sampling techniques, the auditor observed practices in place, interviewed key persons and reviewed pertinent documents and records to assess the systematic performance of the process being audited and the consistency of biosolids management practices with written procedures. Interested parties were interviewed and transaction tests were performed to verify the effectiveness of the management system. The audit was conducted as a systems audit and is not a verification of compliance with any legal requirements applicable to biosolids practices performed by the agency or its contractors.

2D. Reference Materials

The following documents were used as references during this audit:

City of Chattanooga EMS Manual (current version)
National Biosolids Partnership "EMS for Biosolids" standard (May 2002)
National Biosolids Partnership Biosolids EMS Third Party Auditor Guidance (August 2007)
National Biosolids Partnership Code of Good Practice
National Biosolids Partnership Manual of Good Practice

2E. Definitions of Audit Findings & Required Corrective Action

Major Nonconformance – a serious omission from requirements and/or other departure that represents, or could cause, a systemic failure. Major nonconformances must be corrected within 90 days for verification to proceed.

Minor Nonconformance – an isolated departure from requirements that does not represent a systemic failure. Minor nonconformances require timely and effective correction and verification by a Third Party Auditor.

Opportunity (for improvement) – possible improvement in the EMS based on auditor observations. There is no obligation for action in response to these observations.

3. SUMMARY OF AUDIT RESULTS

3A. Verification Conclusion

Based on results of this audit, KEMA is able to issue the following Verification Statement concerning the City of Chattanooga's biosolids program:

"The City of Chattanooga Moccasin Bend Wastewater Treatment Plant has been independently verified by KEMA-Registered Quality Inc. as having an effective biosolids environmental management system that supports continual improvement in environmental performance, meeting regulatory compliance obligations, utilizing good management practices and creating meaningful opportunities for public participation and is in conformance with the requirements of the National Biosolids Partnership."

3B. EMS Strengths

During this audit KEMA noted the following strengths in the City of Chattanooga biosolids management system.

- Plant management clearly understands the benefits of using management systems to continually improve operating results.
- There is clear support from City Council and other public stakeholders for the City of Chattanooga Biosolids Program
- Land application recordkeeping is well managed using effective electronic software.

3C. Outcomes

The City of Chattanooga biosolids program is improving through the use of their biosolids management system. The following improvement outcomes within the past two years were confirmed.

Interested Party Relations

- Establishing a "Sustainability Committee" and attendance at Farm Bureau meetings has established channels of communication for obtaining information and responding to requests from the public.
- Feedback from regulatory agencies confirms improved communications from the City of Chattanooga, including improved site-books and inclusion of the City in land application approvals.
- In response to requests from TNDEC, Chattanooga is now testing biosolids for PCB and TCLP and has verified contents are within acceptable limits.

Quality Practices

- Biosolids quality has improved over the past 2 years, including increased solids to 32% (average) from 25%, resulting in easier application, better agronomic certainty, reduced odor and lower transportation costs.

- Standard Operating Procedures are being developed to enable shift to shift consistency, capture of knowledge and communication of requirements upstream and downstream.
- The City of Chattanooga has implemented a much improved electronic data management system allowing data centralization, improved reporting efficiency (2/3 reduction in employee time) and development of performance measures based on credible data. The electronic system has been linked to the operating system (OPS).
- The City has implemented stricter requirements for transportation and land application contractors, including weekly inspections and direct review of compliance requirements.

Environmental Performance

- The City of Chattanooga pretreatment program & SIU inspections have contributed to a 20% reduction in Hg content in biosolids.
- 100% of the City's biosolids are now being beneficially reused instead of going to landfill ($1.1M/year cost reduction)

Regulatory Compliance

- A communication program with significant industrial users within the Pretreatment Section has resulted in 50% fewer NOVs in the past year and has helped reduce collection system corrosion.

3D. Open Nonconformances

The following nonconformances were found during this audit and remain open. KEMA's Lead Auditor has reviewed the City of Chattanooga's corrective action plans for these nonconformances and found those plans to be acceptable. The effectiveness of corrective action taken will be reviewed during the next third party audit.

Minor Nonconformance JS/08-03/Element 5 NBP EMS Element 5 requires that action plans be developed for achieving biosolids goals and objectives. Action plans for bioslids objectives cannot be distinguished from the objective itself.

Minor Nonconformance JS/08-06/Element 10 NBP EMS Element 10 requires that methods be established at all critical control points to effectively manage potential environmental impacts. Some of the SOP's identified in Table 3.1 as required operational controls are not in place, such as SOPs for thickeners and SOPs for biosolids storage and loading.

Minor Nonconformance JS/08-07/Element 11 NBP EMS Element 11 requires that Emergency Preparedness and Response Plans be established to assure effective response to accidents and emergency situations. Emergency preparedness and response plans in place do not address procedures to follow in the event of a fire, weather-related emergency or chemical spill and do not include emergency contact information.

Minor Nonconformance JS/08-11/Element 16 NBP EMS Element 16 requires that internal audits analyze whether biosolids management policy and goals and objectives are being met. The internal audit conducted in July 2008 did not fully address the extent to which policy commitments are being met and whether goals / objectives are being achieved.

Minor Nonconformance JS/08-13/Element 17 NBP EMS Element 17 & Chattanooga's EMS procedure require management to periodically review performance of the biosolids management system. There are no records demonstrating that performance against established measures has been discussed in management reviews.

3E. Closed Nonconformances

The City of Chattanooga took corrective action in response to the following nonconformances found during this audit and KEMA verified that the action taken has corrected each nonconformance. These nonconformances are therefore closed.

Major Nonconformance JS/08-01/Element 1 NBP EMS Element 1 requires an EMS Manual (or equivalent set) that describes policies, programs, plans, procedures, management practices in the EMS. The City of Chattanooga "EMS Manual" is inconsistent with requirements in the following areas:

- It is not stated how applicable legal and other requirements are incorporated into operational controls.
- No goals or objectives are in place for improving regulatory compliance, environmental performance or relations with interested parties, as required by the City's EMS (procedure 5.1.5)
- There is no procedure for monitoring progress in achieving biosolids goals / objectives.
- Training records are not noted as requiring control and other records requiring control are not identified other than those related to monitoring & measurement.
- The EMS Manual says contractors are not required to have emergency plans / procedures. This is not consistent with requirements of the NBP EMS Elements.
- Document control & recordkeeping procedures do not state how documents requiring control are made available or how records required by the EMS are controlled.
- There is no reference in the EMS Manual to contractor document control & recordkeeping requirements.
- There is no indication how monitoring / measurement is done to ensure compliance with legal and other requirements
- There is no procedure for investigating and correcting / preventing noncompliances other than (Element 14) NPDES permit nonconformances.

Corrective Action

In response to the above nonconformance, the City of Chattanooga modified their Biosolids Management System Documentation (BMS Manual). Each part of the nonconformance shown above has been corrected. This nonconformance is now closed.

Minor Nonconformance JS/08-02/Element 4 NBP EMS Element 4 requires that records of applicable legal and other requirements be maintained. The list of applicable legal and other requirements (EMS Manual, table 4.1) does not include applicable OSHA or DOT requirements.

Corrective Action

In response to the above nonconformance, the City of Chattanooga developed a list of legal and other requirements applicable to their biosolids program and included that list as an appendix to their BMS Manual. This nonconformance is now closed.

Major Nonconformance JS/08-04/Element 7 Several EMS Elements state requirements that the agency must ensure are extended to contractors. Agreement that the City of Chattanooga has with Recyc LLC (transportation and land application contractor) does not specifically state the following:

- contractor roles / responsibilities in the Communications Program
- requirements for operational controls and monitoring / measurement procedures
- requirements for emergency procedures and plans
- documentation, document control and recordkeeping requirements

Corrective Action

In response to the above nonconformance, the City of Chattanooga developed a document that outlines expectations for contractor performance and both the City of Chattanooga and Recyc LLC have agreed to perform in accordance with those expectations as part of their contracted arrangements. This nonconformance is now closed.

Minor Nonconformance JS/08-05/Element 8 NBP EMS Element 8 requires that records of completed training and competence be maintained. Records are not available to demonstrate completion of employee competence training and EMS Awareness training.

Corrective Action

In response to the above nonconformance, the City of Chattanooga organized their recordkeeping following training and demonstrated that training records are being kept. This nonconformance is now closed.

Minor Nonconformance JS/08-08/Element 11 NBP EMS Element 11 requires that the effectiveness of Emergency Preparedness and Response Plans be reviewed and evaluated, including communications systems. There is no record demonstrating that the effectiveness of emergency preparedness and response plans has been tested.

Corrective Action

In response to the above nonconformance, the City of Chattanooga tested their Emergency Preparedness Plans with the local Fire Department on 1/26/09. This nonconformance is now closed.

Minor Nonconformance JS/08-09/Element 12 NBP EMS Element 12 requires that Biosolids Management Program documents and records be maintained and controlled. The lists of documents and records in the EMS Manual that require control does not include some documents that require control (e.g. operating data, emergency plans, contractor agreements, O&M information) and some records that require control (e.g. corrective and preventive actions, incident investigations, biosolids program reports).

Corrective Action

In response to the above nonconformance, the City of Chattanooga developed a list of documents and records that require control, including persons responsible for that control. Documents and records requiring control are consistent with NBP requirements. This nonconformance is now closed.

Major Nonconformance JS/08-10/Element 14 NBP EMS Element 14 requires that noncompliance with regulatory requirements be investigated and corrective action be taken to prevent a recurrence. Corrective and preventive action procedures are not used consistently for different events requiring formal correction (e.g. incidents, noncompliances, audit nonconformances), does not include cause analysis or verification of effective correction.

Corrective Action

In response to the above nonconformance, the City of Chattanooga modified their Corrective and Preventive Action process to ensure it is used to address noncompliances in the same manner as nonconformances. Objective evidence of this use was reviewed and found acceptable. This nonconformance is now closed.

Major Nonconformance JS/08-12/Element 17 NBP EMS Element 17 requires the agency's management to review performance of the biosolids management system relative to policy commitments, goals, objectives and established performance measures as well as the need for changes based on internal audit results and changing circumstances. No records are available to demonstrate that management has reviewed performance against established performance measures, performance against policy commitments, changing circumstances or the results of internal audits.

Corrective Action

In response to the above nonconformance, the City of Chattanooga modified their Management Review process to ensure all required topics are addressed at least annually. Objective evidence of this use was reviewed and found acceptable, except as noted in minor nonconformance 08-13. This nonconformance is now closed.

3F. Opportunities for Improvement

KEMA noted opportunities for improvement in the City of Chattanooga biosolids program that are described in the "Detailed Audit Results" section of this report.

3G. Appeals

The NBP provides an appeals process for biosolids organizations and interested parties that disagree with the findings of a third party EMS audit. The verification appeals process involves an Appeals Board; representing a balance of biosolids management interested parties, including an environmental advocacy group, and wastewater industry professionals. An appeal must be submitted within 30 days of the official verification decision or interim audit decision by the Audit Company. Anyone who may need help in understanding the appeals process should contact the National Biosolids Partnership staff, Mr. Eugene DeMichele at 703-684-2438, or by e-mail: edemichele@wef.org.

An appeal process is available to persons concerned about the methods and/or scope of this audit. Further information about this appeal process can be obtained directly from KEMA (contact Pierre Salle, pierre.salle@kema.com or Jon Shaver jon.shaver@kema.com) or from NBP (contact Eugene DeMichele, edemichele@wef.org).

3H. Agreements

The City of Chattanooga has developed written plans for correcting all nonconformances found during this audit. KEMA's Lead Auditor has reviewed those corrective action plans and determined that effective implementation of the planned action will correct the respective nonconformances. City of Chattanooga will implement the approved plans in a timely manner and review the corrections internally within 6 months. The effectiveness of actions taken to correct nonconformances will be verified during the next assigned third party audit.

The City of Chattanooga and KEMA have agreed that annual interim audits of their Biosolids EMS will be conducted and that at least two of those audits will be Third Party Audits. The dates of the interim audits are to be determined by agreement between the City of Chattanooga and KEMA. The City of Chattanooga will apply for the interim audits through the National Biosolids Partnership.

4. AUDIT OBSERVATIONS + RESULTS

Observations and results of individual audits performed are described below. The National Biosolids Partnership Biosolids EMS Auditor Guidance (August 2007) and the KEMA Audit Planning Guide for Biosolids EMS Audits were used as guides in performing each audit. Nonconformances found during the documentation review and October verification audit that were closed prior to January 30 are summarized in Section 3 of this report.

4A. EMS Documentation Review

City of Chattanooga's Biosolids Management System (BMS) Manual and supporting documents describe the management system being used in managing their biosolids activities. The original manual was organized to correspond to the NBP EMS Elements. The BMS Manual was subsequently modified to reflect processes used in the City of Chattanooga's biosolids management system. The BMS Manual is available on the City of Chattanooga website. The results of KEMA's initial documentation review as part of this audit are included in the appendix of this report.

Audit Results

Review of the BMS Manual and other documentation found that documentation meets NBP expectations and conform to applicable requirements of the EMS Elements.

In addition, the following opportunities were noted:

- The Biosolids EMS Manual could be simplified and shortened.

4B. Biosolids Production Operations

Pretreatment & Collection

Pretreatment arranges permits with industrial users that require self-monitoring for metals and other pollutants. Chattanooga's Pretreatment Division checks significant industrial users (>25MGD) approximately twice annually. NOVs requiring correction are issued for compliance failures that could lead to more stringent enforcement. SOPs are in place to describe how Pretreatment and Collections are controlled.

Wastewater Treatment & Solids Generation

The facility uses coarse screens, grit removal and fine screens to separate large debris and inorganic material such as plastic, sand, etc. that could impact downstream wastewater treatment equipment and degrade the biosolids quality. Wastewater is then treated in primary clarifiers to settle suspended solids prior to the biological treatment process. Primary sludge is pumped to gravity thickeners. Primary effluent flows to equalization basins, which provide storage during high flow periods and provide the capability to have a uniform flow rate to the secondary treatment system, which uses pure oxygen biological treatment to remove organics. Secondary clarifiers remove organic biomass generated in the pure oxygen treatment system. Solids from the secondary clarifiers are either returned to the pure oxygen system or are wasted to gravity thickeners.

Operational controls are in place for the primary treatment system (screening and grit removal, and primary sedimentation) and for the secondary treatment system (pure oxygen and secondary

clarification). The operational controls are consistent with the National Manual of Good Practice. Visual observations of the critical control points, interviews with operators and management, and inspection of standard operating procedures (SOPs) procedures were used to confirm the operational controls were in place. Operators were knowledgeable of the treatment processes and the impacts these processes can have on the biosolids quality. The measurement and monitoring systems, along with documentation system, were found to be excellent sources of data and information to ensure good operational control.

Solids Stabilization, Conditioning & Handling

Gravity thickeners, anaerobic digestion, and centrifuges followed by lime addition are used to stabilize and dewater the biosolids. Solids are transferred from the primary thickeners to the digesters prior to pumping to the solids mixing/holding tank. Solids from the secondary sludge thickeners are pumped to the solids holding/mixing tank, where they are blended with the primary solids. The blended solids are then processed through centrifuges to increase solids content to greater than 20%. The biosolids exiting the centrifuges are mixed with lime to achieve a pH of at least 12.0 and solids content is typically near 30%. The resultant processed biosolids meet Class B biosolids criteria and monitoring indicates that Class A standards are often achieved.

Operational controls are in place for the biosolids stabilization processes and are consistent with the National Manual of Good Practice. Visual observations of the critical control points, interviews with operators and management, and inspection of the procedures documented in the plant SOPS were used to confirm the operational controls were in place. Operators were knowledgeable of the treatment processes; the impacts the processes can have on the biosolids quality, and were familiar with the operating and monitoring procedures. Specific SOP's related to the centrifuge and lime addition operations were reviewed. The digesters at this facility are not considered a critical control point, as they are used primarily for primary solids storage and some increase in solids concentration.

A laboratory in the dewatering building is used by the centrifuge operators to monitor the biosolids dewatering operation. Operators measure the percent moisture and solids content the centrifuge solids every shift and track the pH of the lime treated biosolids. These data provide information to verify biosolids quality (solids content) and/or to allow process adjustments (e.g. polymer feed rates) to be made as the biosolids are dewatered. The measurement and monitoring systems were found to be excellent sources of data and information to ensure good operational control. All operators have access to all of the operating data.

Transaction test – Tracked the flow of samples and data used to verify biosolids meet Class B standards from the solids operation through the lab. Solid operators sample and perform initial pH and solids tests (zero time and 2 hours). Sample then goes to lab with a chain of custody form and is tested for pH after 24 hours. Some samples on a defined schedule are analyzed for fecal coliform, metals, and viruses. All data is available through LIMS and consolidated in the OPS system. It is easy to track all results for a given sample day and over the history. Tracked sample and analysis to verify system and it works very well.

Biosolids Storage & Transportation

Dewatered biosolids are transferred from the centrifuges by contractor operated trucks (dedicated in-plant trucks) to a concrete pad storage area. Solids are segregated into two areas, the older material

from the previous day, which is being loaded for offsite transport, and the current material being produced. Biosolids are typically stored for only short periods (1-2 days) before off site shipment occurs. Trucks are loaded with a front-end loader. Every truck entering the facility for biosolids hauling crosses the onsite truck scale and obtains an empty truck weight. After filling the truck with biosolids, the driver places the tarp over the load, proceeds to the truck wash station, cleans the outside of the vehicle, and returns the truck to the weigh scale. The driver then obtains a heavy weight for the truck from the plant scale operator and determines that the truck is within allowed load limits. With this system, no truck should leave the facility if it is overweight. If a truck is overweight, then biosolids are removed prior to the truck leaving the site. Paperwork with the destination of the load and truck weights is exchanged between the plant scale house operator and the driver, so both the facility and the contractor have a record of each load.

The Class B biosolids in the storage area are tested for metals, pathogens, and other parameters in accordance with the Federal regulations. These measurements are in addition to controlling the biosolids pH and moisture content.

Weighing, loading, heavy weight measurement, tarp placement, and inspection were observed directly during the audit. The first driver observed at the plant during the audit had a notebook with spill prevention information, contact phone numbers, and the biosolids information with him in the cab. Inspection of the truck found it to be in very good condition and properly licensed. The driver also knew the procedure to follow in the case of a spill or accident on the road. However, there was no shovel for cleanup of small spills on the truck. This was noted to the contractor and appears to be anomaly. It was mentioned to the contractor and this truck did have a shovel on board the next day when it was observed at the field location. All other trucks observed had shovel on board, in addition to the information and contact binder in the cab. Inspection of the trucks found them to be in very good condition.

Audit Results

Review of the BMS Manual and other documentation found that documentation meets NBP expectations and conform to applicable requirements of the EMS Elements, except as noted below.

> Minor Nonconformance JS/08-06/Element 10 NBP EMS Element 10 requires that methods be established at all critical control points to effectively manage potential environmental impacts. Some of the SOP's identified in Table 3.1 as required operational controls are not in place, such as SOPs for thickeners and SOPs for biosolids storage and loading.

In addition, the following opportunities were noted:

- Worker instructions and related documents should be converted to the new format being implemented for SOP's.

4C. Biosolids Use & Disposition - Agriculture

Class B biosolids from the City of Chattanooga are transported to land application sites and land applied by a contractor (Recyc LLC Inc.). Land application (corn, wheat, soybean, hay, pasture) and spreading is performed in accordance with Recyc standard procedures, including agronomic calculations (approved by City of Chattanooga) and supervised by the contractor field supervisor. Applications in Tennessee are pre-approved by TNDEC, although a series of applications in 2007 were done based on verbal approval only, leading to an NOV against the City of Chattanooga.

Corrective action was taken by the City in response to that complaint. Land application in Alabama is controlled by EPA, however does not require formal approval (confirmed in discussion with EPA during this audit).

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements. See also audits of "Contractor Control" process.

In addition, the following opportunities were noted:

- Land application inspections could include assessment of activities based on applicable critical control points.

4D. Communication Program

The internal and external communication processes are described in Section 9 of the EMS Manual. The facility has developed an external communication procedure that includes identification of interested parties. A Sustainability committee includes approximately 50 members. The membership includes neighbors, environmental groups, farmers and land owners where biosolids are used, elected officials, and other interested parties. Interviews with state and local regulators and with environmental groups and farmers indicate the communication system is working effectively. All interviewees were satisfied with the level of communication.
Several methods are used to communicate with the public including brochures, presence at public meetings, email, and phone contact. The City of Chattanooga has a "311 system" that receives calls from the public and routes them to the appropriate city department. Biosolids related calls are rerouted to the wastewater plant and can be received by the EMS coordinator, supervisors, and other personnel. The goal is to respond to all inquiries within 24 hours. Documentation of inquires is a manual log system with each person maintaining a separate log to track responses. The process appears to be working, but tracking the inquires and responses are cumbersome with the decentralized record keeping system. When received, odor complaints have been handled satisfactory using the current system.

Internal communication about the EMS, including overall requirements and individual responsibilities, occurs periodically during staff meetings. Weekly operations and maintenance meetings are held by the supervisors in each area, and monthly "zero tolerance" meetings between the Division Director and all supervisors focus on plant regulatory compliance and operational issues. The EMS is also discussed at these meetings. Project specific meetings and email are also used for internal communication.

Both the State (TDEC) and federal (EPA) biosolids regulators interviewed during this audit were satisfied with the City of Chattanooga's regulatory reporting and their external communication about biosolids. Both noted that input from the public is less frequent of late, but starting to become more sophisticated. The City responded effectively to an incident involving unapproved land application in TN. The federal regulator recognizes a void in approval of land application sites exists in Alabama.

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements.

In addition, the following opportunities were noted:

- The process / procedure in place for responding to public complaints / concerns could be directed through a single individual to allow easier tracking and trend analysis.
- Increase internal communication of EMS information to all employees on regular basis, including providing information on the performance of the biosolids program.
- Add the biosolids information, policy, manual, audit results, biosolids use and quality to the website to facilitate public access.
- It could be helpful to identify and prioritize how each method of proactively communicating with the public is used in order to measure the effectiveness of each method.

4E. Competency, Awareness & Training

Training requirements and procedures are described in Section 8 of the EMS Manual. EMS Awareness training requirements are stated in the EMS Manual. All personnel with biosolids responsibilities receive annual refresher training in the EMS. Contractors provide training in the handling of biosolids appropriate for their roles / responsibilities.

The training program approach and records were reviewed. There is a specific requirement for safety training and documentation maintained for that program, plus for special training. EMS training is required at least annually, but the annual review had not yet occurred because the program is less than a year old. Interviews with operators indicated that some were aware of the EMS through initial awareness training with supervisors, but other employees appeared to be unfamiliar with the EMS and critical control points. There was no formal documentation indicating that all employees had received the initial EMS awareness training. While it appears that the EMS had been discussed at the various plant meetings, it may not have been specific enough to the EMS program for all operators to retain the information.

Operator interviews indicate that they are knowledgeable about the operations and controls in their area of the plant and have obtained the required training to control the treatment systems through on the job training and related training programs. The operator training required is determined by the area supervisor (liquids, solids, maintenance, etc.). There is no formal training schedule or records (with supervisor and operator signature) for operator skills training. The system relies primarily on on-the-job training and observations by the supervisors.

<u>Audit Results</u>

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements.

In addition, the following opportunities were noted:

- More specific requirements for training employees in specific jobs could be developed to clarify the statement in the EMS plan that “all supervisory personnel will seek and recommend appropriate training sessions for their employees”.

4F. Compliance (with legal & other requirements)

The legal and other requirements are described in Section 4 of the EMS manual. Applicable legal requirements are listed in Table 4.1, which include Federal and State of Tennessee requirements. The State of Alabama has elected to defer all biosolids related activities to USEPA Region 4 and does not have any specific state requirements. This situation was confirmed by phone call to USEPA Region 4. The facility has elected to use site plan documentation that meets the Tennessee requirements for Alabama sites so that documentation is available on the sites being used. The list of applicable legal requirements does not currently include OSHA or DOT requirements.
The Waste Resources Director, EMS Coordinator, Plant Engineer, and Laboratory Supervisor are responsible for tracking current and future requirements. Specific sources of information, such as the EPA website, Tennessee website, NPB updates, etc., are assigned to specific individuals to monitor potential new regulations that could affect the facility Biosolids program. Information is passed to managers and to the Director by email.

Compliance in production operations is monitored through lab testing of biosolids samples (hourly/daily/weekly/monthly) and operational controls that have parameters set well within compliance requirements.

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements.

In addition, the following opportunities were noted:

- Other requirements could reflect the use of site plans for Alabama sites, equivalent to those used in Tennessee.
- Additional monitoring could occur for PCB and TCLP

4G. Contractor Control

Biosolids produced at MBWWTF are transported to end-use sites by Recyc LLC under contract. Recyc also land applies the biosolids at pre-arranged sites. Approval for specific land application sites in TN is now obtained from TDEC after a “miscommunication” in 2007. No regulatory approval is needed in Alabama. Recyc field operations are supervised by their own personnel and periodically inspected by Chattanooga personnel. Recyc has developed their own operational controls.

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements

4H. Critical Control Points & Operational Controls (Identification)

Chattanooga has identified critical control points used in preparing operational controls for environmental impacts. From discussions during the audit it is clear that CCP and operational controls are also used to control biosolids quality, compliance with legal requirements and help address public acceptance priorities. CCP and related operational controls are documented in the EMS Manual and are consistent with the Manual of Good Practice.

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements.

4I. Document Control & Recordkeeping

Documents requiring control are identified and reviewed as stated in the EMS Manual. Operations records are kept electronically on the City of Chattanooga server. Land application and complaint records are kept using an externally developed software package (Material Manager) that is effective and easy to use.

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements.

In addition, the following opportunities were noted:

- Procedures for controlling documents and controlling records could be simplified.

4J. Emergency Preparedness

An Emergency Preparedness and Response procedure has been established that addresses various emergencies that could occur at MBWWTP, including biosolids spills.

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements, except as noted below:

> Minor Nonconformance JS/08-07/Element 11 NBP EMS Element 11 requires that Emergency Preparedness and Response Plans be established to assure effective response to accidents and emergency situations. Emergency preparedness and response plans in place do not address procedures to follow in the event of a fire, weather-related emergency or chemical spill and do not include emergency contact information.

In addition, the following opportunities were noted:

- Several fire extinguishers had testing records that indicate testing is not up to date (> 1 year old).

4K. EMS Planning & Public Participation

Chattanooga wants to use a systematic approach to ensure a consistent, recognized biosolids product, find additional uses for their biosolids and reduce complaints (particularly odors) and help develop a higher quality Class A product. After joining the NBP program in 2005 EMS efforts proceeded slowly until early in 2008. The Plant Superintendent has been authorized to implement the Biosolids Management System. Public input is obtained through various means, including direct input and attendance at public meetings such as the Biosolids Sustainability Committee.

Audit Results
Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements.

4L. Engineering

The plant engineer is responsible for maintaining current process and design information for access by the plant personnel and contractors. Drawings and information are maintained in the administration building next to the engineer's office. Drawings are also available electronically through the City of Chattanooga Engineering department. The plant engineer has online access to these drawings. Review of the on line system and files indicate the information is update.

Consulting engineers hired through the City of Chattanooga selection system design new projects for the facility. The plant engineer has input into the design, but primary project management responsibility lies with the city engineering department. Purchasing in the city handles the bidding process and a project manager from the city engineering department is assigned to monitor construction activities. The plant engineer works with the city project manager as needed, and is responsible to ensure that drawings and O&M manuals for all new equipment and systems are delivered to the facility.

The plant engineer also ensures that Operation and Maintenance manuals for equipment are available. The O& M manuals are currently stored using a decentralized approach. The manuals are located in the control rooms and nearby areas adjacent to the processes and equipment locations. The manuals reviewed were update for new equipment. Manuals were also available for older equipment.

Audit Results

This process was found to conform to applicable requirements of the EMS Elements and meet NBP expectations.

In addition, the following opportunities were noted:

- A centralized storage location for O& M manuals could simplify controlling these documents.

4M. Goals & Objectives

Long range goals for the biosolids program are established by the Management Team based on strategic direction and input from the City Council that includes public input. Shorter term objectives are set for each goal and progress in achieving them is tracked by the Management Team. Once achieved objectives are replaced by new objectives.

Audit Results
Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements, except as noted below:

> Minor Nonconformance JS/08-03/Element 5 NBP EMS Element 5 requires that action plans be developed for achieving biosolids goals and objectives. Action plans for bioslids objectives cannot be distinguished from the objective itself.

In addition, the following opportunities were noted:

- The State of Tennessee goal to have 25% waste diversion noted in the Biosolids Policy resolution could relate to a biosolids goal or objective.

4N. Internal Audits

The City of Chattanooga conducted an internal audit of their biosolids management program in July 2008. The audit was conducted by personnel from nearby agencies under direction of the EMS Coordinator. Results were reported to the EMS Coordinator and Plant Manager and Management Team meetings were held to determine action in response to audit findings.

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements, except as noted below:

> Minor Nonconformance JS/08-11/Element 16 NBP EMS Element 16 requires that internal audits analyze whether biosolids management policy and goals and objectives are being met. The internal audit conducted in July 2008 did not fully address the extent to which policy commitments are being met and goals / objectives are being achieved.

In addition, the following opportunities were noted:

- Internal audit reports could note that purpose of the audit and summarize conclusions about that performance to help management interpret the audit results.

4O. Maintenance

The Maintenance Section performs mechanical and instrumentation / electrical repairs on plant equipment and lift stations. A “Total Maintenance System” program generates a large number of work orders, including preventive maintenance based on O&M recommendations from equipment manufacturers. Job descriptions define minimum qualifications for maintenance technicians. Performance measures to assess maintenance effectiveness are not used.

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements.

In addition, the following opportunities were noted:

- O&M Manuals could be centralized rather than separated between maintenance and engineering departments.

4P. Management Involvement (incl Policy, Mgmt Review)

The City of Chattanooga Biosolids Policy Statement was approved by City Council resolution and is documented in the BMS Manual and available on the City’s website. This policy includes commitment to the principles of the NBP “Code of Good Practice” and was used as a fundamental starting point for the biosolids management system. The policy statement is available to interested

parties upon request and communicated to contractors in expectations documents and to employees through EMS Awareness training.

Monthly meetings are held by the Management Team and discussion includes biosolids program activities. The suitability, adequacy and effectiveness of the biosolids program and management system is addressed at least annually by the Management Team and at a City Council meeting that includes the MBWWTP Plant Superintendent and communicated openly in an annual performance report.

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements, except as noted below.

Minor Nonconformance JS/08-13/Element 17 NBP EMS Element 17 & Chattanooga's EMS procedure require management to periodically review performance of the biosolids management system. There are no records demonstrating that performance against established measures has been discussed in management reviews.

In addition, the following opportunities were noted:

- Performance measures (e.g. KPI) could be established to help direct and assess performance of different biosolids activities.
- Management review could be described and established as a process involving different stages of review rather than a single meeting discussing short term and long term effects of the management system.

4Q. Preventive and Corrective Action

The EMS intends that formal corrective action be taken in response to noncompliances and system nonconformances. Corrective action, including a series of reviews and agreements, was taken in response to a Notice of Violation received in 2007 from TNDEC with respect to the NPDES permit. Corrective action was also planned and completed in response to an odor complaint received in February 2008.

Audit Results

Review of the process described above found it meets NBP expectations and conforms to applicable requirements of the EMS Elements.

In addition, the following opportunities were noted:

- The CAPA process could provide more detail about different events that trigger CAPA and also describe how trends in CAPA are analyzed.

APPENDICES

Appendix 1 List of Participants

The following persons participated in this audit. Other persons provided additional explanations, as necessary.

City of Chattanooga Personnel

James Banks	Chief Operator
Alice Cannella	Plant Superintendent
Terry Davis	Operator – Solids
Danny Deal	Operator – Solids
Perry Ferguson	ISS Project Coordinator
Billy Geren	IT
Brian Lessman	Plant Operations Supt – Solids
Jim Neely	Maintenance Supervisor
Mike Patrick	Collection Systems
Paul Patterson	Supervisor –Lab
Jeremy Poarch	Engineer
Carol Poll	Administrative Assistant
Joyce Snyder	Administrative Assistant
Jerry Stewart	Director WRD
Rick Tate	Pretreatment Supervisor
Randy Thebo	Operator – Liquids
Joachim Volz	Fiscal Coordinator
Gary Williams	Safety and Training Coordinator

Other

James Brown	Exec. Director Tennessee River Gorge Trust
Ron Carper	CLC Cattle Company
Chad Raines	Field Supervisor – Recyc
Wayne Dalton	Trucker Recyc
Cleveland Grimes	Hamilton County WWTA
Mike Hom	USEPA Region 4
Travis Mosier	Trucker Recyc
Bob O'Dette	Regulator – TDEC-WPC (Tennessee)
Gary Pope	Farmer
Adonia Phillips	Plant Supervisor Knoxville Utilities
Sydney Spencer	Engineer -Air Pollution Control Bureau Chattanooga-Hamilton County
Todd Trew	Farm Services
Ricky Turner	Owner –Recyc LLC
Sharoyn Welch	Soil Conservation Service

Appendix 2 Documentation / Objective Evidence Reviewed

2008 Internal Audit Summary dated July 2008
Agreement – Beneficial use of Biosolids 4/17/05
Amendment 1 5/4/07 – Request for council approval
Biosolids fact sheet 2007
Biosolids performance report 2/19/08
Biosolids Policy – resolution 25096 4/24/07
Centrifuge operator training checklist 3/1/07
Centrifuge startup SOP 11/7/07
Committee for Biosolids Sustainability – member list
Complaint records (9/11/08, 8/27/08)
Emergency Preparedness & Response Plan 10/15/08
Fire extinguisher inspection tags (various)
FOG Program goals & objectives 4/10/08
Information re NOV 8/28/07 (various letters & reports)
Internal audit report July 9-10, 2008
Job Descriptions (various)
List of legal & other requirements 2008
Materials Manager screens (various)
Monthly “Zero Tolerance” meeting agenda (various)
Monthly safety & health meeting attendance 8/15/08
Operations datasheets (various)
Presentation to City Council (re biosolids program) April 2008
Pretreatment SOPs 7/2/07
Recyc SOP – Biosolids reuse operations 10/15/08
Recyc SOP – field operations
Recyc SOP – Transportation 10/13/08
Recyc transportation tailgate meeting
Recyc Tracking report crop year 2009
Site inspection records (various)
SOP numbering system 5/14/08
Spreading Map – Howell Moss Farm
Sustainability Committee mtg 6/26/08
TN DEC complaint 203333414 (8/5/02)

Appendix 3 Desk Audit Findings (by EMS Element)

The following "observations" and "comments" were made during the review of City of Chattanooga EMS Documentation (EMS Manual). Results of the review were reported to the City of Chattanooga September 16, 2008. "Observations" can lead to EMS nonconformances if not corrected. "Comments" are for consideration only and do not require action. Many of the "observations" were corrected following this documentation review. Those not corrected were included in nonconformances identified above.

Element 1 - Documentation of EMS for Biosolids

The City EMS Manual describes procedures it uses to manage its biosolids activities. The manual is organized into 17 "Elements" that correspond sequentially to the NBP EMS Elements. Each element has a unique identification (name and number), revision date and number and approval.

Observations

See observations included in discussion for each element.

Comments

- There is no description of the purpose of the EMS or the interaction of processes within it.
- There is no indication on the EMS Manual documentation that each element has been approved (approval space blank).

Element 2 - Biosolids Management Policy

EMS Manual Element 2 provides the Biosolids Management Policy Statement. The NBP Code of Good Practice is referenced.

Observations

None – see comments below

Comments

- It is not clear how the Biosolids Policy is incorporated into biosolids programs, procedures and practice other than operational controls and goals and objectives.
- There is no specific reference to communicating the Biosolids Policy Statement internally or externally.
- Element 2 says revisions to the policy may be needed "because of changing conditions", however there is no indication of what those conditions could be or how they are identified.

Element 3 - Critical Control Points

EMS Manual Element 3 (Critical Control Points) defines critical control points and related environmental impacts and operational controls. Appendix 3A lists critical control points and operational controls.

Observations

None – see comments below

Comments

- Table 3.1 is not dated and therefore it is uncertain if information on it is up to date.

Element 4 - Legal and Other Requirements

EMS Manual Element 4 describes procedures and responsibilities for identifying and tracking applicable legal and other requirements. Appendix 4A lists legal and other requirements, appendix 4B provides a summary of permits and licenses, appendix 4C provides permit and license due dates.

Observations

1. It is not clear from EMS Manual how applicable legal and other requirements are incorporated into operational controls.

Comments

- The distinction between legal requirements and other requirements could be more clearly described.

Element 5 - Goals and Objectives for Continual Improvement

EMS Manual Element 5 describes procedures and responsibilities for developing biosolids goals and objectives and monitoring in achieving them. Appendix 5B provides an EMS Workplan.

Observations

2. There are no goals or objectives in place for improving regulatory compliance, environmental performance or relations with interested parties, as required by the City's EMS (procedure 5.1.5).

Comments

- There are no current objectives in place for the goal to "maintain 100% beneficial reuse of biosolids".
- It is not clear how biosolids goals and objectives are integrated into other EMS elements and biosolids activities.
- Biosolids goals are presented like short term objectives, while biosolids objectives are presented more like action plan steps to achieve the goal,
- Measurability is time-related for all objectives. While this is acceptable, continual improvement could be better tracked if measurability was described in terms that management, employees and interested parties could more easily identify performance.
- The Action Plan & Tracking Template (EMS Manual) is not dated so it is uncertain if the objectives on this form are current and/or updated.
- Action plans do not include steps needed to accomplish each objective.
- The Action Plan & Tracking Template requires inclusion of resource needs, but this column has not been completed.

Element 6 - Public Participation in Planning

EMS Manual Element 6 describes procedures and responsibilities for public involvement in biosolids program planning. Appendix 6A provides a list of interested parties.

Observations

None – see comments below

Comments

- While many different opportunities are available for public participation in the EMS, there is no clear indication of what the City of Chattanooga does with input received to help plan and improve their EMS.
- Involving interested parties in third party audit process is not mentioned in EMS Manual Element 6 or 9.

Element 7 - Roles and Responsibilities

EMS Manual Element 7 describes roles, responsibilities and competency within the biosolids EMS. Appendix 7A provides a roles and responsibilities matrix.

Observations

3. The EMS Manual Element 10 says Table 3.1 includes "roles and responsibilities and environmental outcomes", however roles and responsibilities are not stated in that Table and it is not clear how environmental impacts (referenced in the Table) relate to environmental outcomes.

Comments

- There is no mention in EMS Manual Element 7 about responsibilities for controlling contractors.
- Appointment of EMS Coordinator and authorization for the responsibilities and authorities of that position are not apparent in the EMS Documentation.
- While responsibilities of the EMS Coordinator are described throughout the EMS Manual, there is no summary or other mention of EMS Coordinator role and responsibilities in Element 7.
- There is no indication in EMS Documents as to how resource needs are identified and/or how resources are provided.
- A "contract document" with the transportation & land application contractor is mentioned briefly in Element 7, but there is no indication of how this document is developed or how the City of Chattanooga determines if the contractor is performing in accordance with that contract and/or other responsibilities defined in the EMS Manual (e.g. Table 4.1)

Element 8 - Training

EMS Manual Element 8 describes training plans and requirements within the biosolids EMS.

Observations

4. Training records are not noted in EMS Manual Element 12 (Document Control & Recordkeeping) as requiring control.

Comments

- There is no mention as to how employee competency in performing their job tasks is assessed with the desire of continually improving that performance.
- It is difficult to ensure that all contractor personnel involved in biosolids activities receive training as specified in EMS Manual Element 8.

Element 9 - Communication

EMS Manual Element 9 describes requirements and procedures for internal and external communication about biosolids program activities. Appendix 9A is used to record public input and inquiries, appendix 9B is the form for public input and inquiries.

Observations

None – see comments below

Comments

- There is no mention in the EMS Manual about how the effectiveness of the external communication program is determined and improved.
- Making "an effort" does not ensure timely response to inquiries by interested parties.

- It is not clear how relevant information about biosolids management activities is communicated to contractors.
- It could be helpful to more specifically define how contractors "may play a role" in the communications approach.

Element 10 - Operational Control of Critical Control Points

EMS Manual Element 10 describes requirements for controlling operations within the biosolids EMS scope.

Observations

None – see comments below

Comments

- According to the EMS Manual, operational controls include SOPs and Monitoring / Measurements. It is not clear why these are stated separately in Table 3.1
- It is not clear how the need for operational controls is determined.
- A significant number of operational controls are identified. EMS Manual says these are reviewed annually, which may become difficult and unnecessary to do regularly
- Operator skills are not listed as operational control method, however it is likely that this is a primary method for controlling operations.
- Element 10 says operational controls are used to ensure critical control points are effectively managed, however except for an inference (environmental outcomes) there is no indication what "effectively managed" means or is intended to achieve.
- It is not clear how operational controls are developed or used to ensure biosolids goals and objectives are met.
- There is no indication how the City requires and ensures that contractors establish operational controls consistent with their roles and responsibilities

Element 11 - Emergency Preparedness and Response

EMS Manual Element 11 describes requirements and procedures for emergency preparedness and response related to biosolids program activities.

Observations

5. The EMS Manual says contractors are not required to have emergency plans / procedures. This is not consistent with requirements of the NBP EMS Elements.

Comments

- EMS Manual says the Emergency Plan is "currently being prepared". Not having this plan in place would be a major nonconformance.
- EMS Manual says emergency plans reviewed / updated at least every 2 years, but does not state how this is done.
- There is no reference in the EMS Manual for how the City ensures emergency equipment is readily available.

Element 12 - EMS Documentation, Document Control and Recordkeeping

EMS Manual Element 12 describes requirements and procedures for controlling documents and records used in managing biosolids program activities.

Observations

6. The document control procedure does not state how the City ensures documents requiring control are available and can be easily located, or how authority for approving controlled documents is assigned / authorized.

7. Records requiring control are not identified other than those related to monitoring & measurement.

8. There are no written procedures for controlling records required by the EMS other than stating where records are kept.

9. There is no reference in the EMS Manual to contractor document control & recordkeeping requirements.

Comments

- There is no indication of approval authorities for documents requiring control.
- It is unusual that documents requiring control do not include Emergency Plans, job descriptions, and agreements with contractors. This will require explanation.
- "Periodic" review of documents requiring control is not specific.
- Requirements for reviewing / updating SOPs are stated elsewhere in the EMS Manual. Those requirements could be more appropriately included in the document control requirements.

Element 13 - Monitoring and Measurement

EMS Manual Element 13 describes requirements and procedures for monitoring and measuring biosolids program activities.

Observations

10. Required monitoring and measurement is noted in Table 3.1, however that table does not state how monitoring / measurement is done to ensure compliance with legal and other requirements.

Comments

- There is no documented procedure for monitoring compliance with other requirements.
- There is no indication how monitoring / measurement records other than analytical data and progress towards goals and objectives are recorded.
- It is not clear from Elements 4 or 13 how compliance with legal and other requirements is ensured.
- Responsibilities for monitoring & measurement are not stated, other than EMS Coordinator being responsible for monitoring progress towards goals & objectives.

Element 14 - Nonconformances: Preventive and Corrective Action

EMS Manual Element 14 describes requirements and procedures for identifying, correcting and preventing nonconformances in biosolids program activities. Appendix 14A provides a Corrective and Preventive Action form; appendix 14B provides a spreadsheet for tracking corrective and preventive action.

Observations

11. There is no procedure in the EMS Manual for investigating and correcting / preventing noncompliances other than a reference (Element 14) to NPDES permit nonconformances.

Comments

- Element 14 says the corrective & preventive action process is used to address "conformance issues that may arise from monitoring / measurement activities", however there is no procedure stated for identifying / investigating / correcting / preventing those nonconformances.
- The Preventive and Corrective Action procedure does not indicate what happens if action taken is not effective.

Element 15 - Biosolids Program Periodic Performance Report
EMS Manual Element 15 describes requirements for preparing Biosolids Management Program Performance Reports.

Observations

None – this Element not included in the Verification Audit scope.

Element 16 - Internal EMS Audits
EMS Manual Element 16 describes requirements and procedures for conducting internal audits of biosolids program activities. The report of internal audit conducted in July 2008 was provided to the auditor and included in this review.

Observations

12. The internal audit conducted in July 2008 did not make any determination about whether the City is effectively meeting its biosolids policy commitments or progress in meeting biosolids goals and objectives.

Comments

- The scope of internal audits is stated as "program activities completed during the previous operating period". It is not clear what this means and it appears to be incomplete in achieving the intended purpose to "determine biosolids program effectiveness".
- While the audit report is available for review on the intranet, there is no indication that results are reviewed with managers responsible for the areas being audited.
- The protocol being used in internal audits is not referenced in Element 16.

Element 17 - Periodic Management Review of Performance
EMS Manual Element 17 describes requirements and procedures for conducting management reviews of biosolids program suitability, adequacy and effectiveness... Appendix 17A provides a worksheet to identify management findings.

Observations

None – see comments below

Comments

- There is no indication in Element 17 that performance relative to policy commitments is discussed during management reviews.
- Element 17 does not state how changes resulting from management reviews are implemented.

END OF REPORT